ON VENTILATION

BY MEANS OF

BOYLE'S

PATENT SELF-ACTING AIR-PUMP VENTILATORS,

FROM

"THE SANITARY REVIEW," 2nd August, 1875,

AND

"BRITISH MERCANTILE GAZETTE," 15th October, 1876.

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THAT a full and constant supply of fresh pure air is the most essential condition to good health and general well-being has always been acknowledged by the public at large as well as by those who have made the principles of sanitary science their special study. Indeed this necessity appears so obvious to our nineteenth-century eyes that we are apt to wonder at the ignorance displayed by our forefathers in this respect; yet we unfortunately see around us evidences that this question of ventilation, though now far better understood and considered than in past times, secures by no means the attention it deserves. It may perhaps be pleaded as an excuse for this persistent negligence of so important a consideration, that until within the last few years the arrangements devised for effecting the perfect ventilation of the places we inhabit, whatever their character, have not satisfactorily fulfilled the functions for which they were designed. Since the introduction, however, of Messrs. R. Boyle and Son's self-acting air-pump ventilators this plea can no longer be urged; for it must be conceded by all, who have tested the merits of their invention, that this eminent Glasgow firm has solved and solved, we think, with complete success the problem which has puzzled scientific men for so many years. On visiting Messrs. Boyle's London offices and show-rooms, in Mansion House Buildings, the other day we were favoured with a view of these ventilators and their admirably simple method of working. The ventilators, which are constructed on sound scientific principles and in strict accordance with the simple, unerring laws of nature, are adapted to every description of building; their size and number being regulated by the dimensions of the space they are intended to ventilate, the number of persons frequenting such space, the number of gas jets, &c. The fixed ventilator is so constructed, and the different parts so nicely adjusted, that the gentlest breath of air impinging on them from any point produces a motive power on the principle of the air-pump for extracting the vitiated air. Being a fixture with no mechanical movement it is never liable to get out of order, and can be constructed to suit any style of architecture. It can also be fitted into church spires or turrets in place of the louver boards, which invariably send down into the building a large body of cold air. The special advantages of these ventilators are, that they are continuous in their action, and being self acting in every part require no attention. By effectually extracting the hot, vitiated air as it is generated, the place is always kept pure and sweet, the supply of fresh air being admitted through inlets fixed at the bottom of the building, and so constructed that the current of air can be regulated according to the emergencies of the season. By a simple contrivance also the air thus admitted striking on a flat frontage is spread along the walls of the building, and thereby all inconvenience to the inmates in respect of draughts is prevented. On the occasion of our visit to the show-rooms a few days since, the Messrs. Boyle tested the action of the ventilator affixed to the roof of the offices by means of Lowne's anemometer. This is an eighteen-inch ventilator, with a six-inch pipe or shaft connecting the ventilator with the room below, and the result of the experiment was to show that the vitiated air rushed up the tube at a velocity of 450 feet per minute. The strength of the upward current of air was further demonstrated by holding a wax taper immediately below the mouth of the shaft; the flame was first drawn up to a great height, then the draught becoming too powerful it was extinguished; and also by placing a piece of wool close to the aperture, which was at once sucked up. In regard to the actual construction and working of this ventilator they may be shortly described as follows:—The ventilator consists of four sections, each acting independent of the other; the external air impinging on the louver plates (or diaphragms) is deflected at different angles over the central radial plates, and in passing out exhausts the internal chambers, creating a partial vacuum. The foul air immediately rushes up the shaft to supply the place of the air which has been extracted, and thus secures a powerful continuous upward current while no downward draught can occur. Before leaving this subject of experiments we desire to take the opportunity of mentioning that all who are interested in the question of ventilation are respectfully invited to inspect the merits and working of the apparatus for themselves, and from the knowledge we have gained of Messrs. Boyle and Son we can assure them a ready and courteous reception.

The advantages which seem so apparent in these ventilators will doubtless be duly appreciated upon their becoming more widely known; indeed their future popularity would appear to be assured by the fact, that the ventilators are already in use at several large and important buildings in the metropolis.—*Sanitary Review.*

In a recent number of this journal we gave some particulars respecting the ventilating of public buildings, works, warehouses, dwelling-houses, stables, water-closets, ships, etc., by means of Boyle's Patent Self-Acting Air-Pump Ventilators. *See British Mercantile Gazette*, for Aug. 15, 1876. We have since had an opportunity of obtaining further information on the subject, and desire to present the same to our readers. The Air-Pump Ventilators, after repeatedly being put to the most severe tests, have been pronounced by the most eminent scientific and practical men in the kingdom, to be the most effective yet brought out. In fact, that the grand problem, "How to obtain efficient ventilation," has undoubtedly been solved at last by Messrs. R. Boyle & Son, in the producing of an apparatus constructed on sound scientific principles, and acting in strict accordance with the simple and unerring laws of nature. An apparatus in fact that cannot fail to act favourably under all conditions of the weather, as has been incontestably proved by repeated experiments conducted under the supervision of the most competent authorities upon the subject. The great difficulty hitherto in ventilating a building, has been to carry off the vitiated air continuously without the aid of mechanical means or heat, which entails great expense and trouble, and to admit a supply of fresh air without causing any draughts or inconvenience to those in the building. Now, unfortunately, sad experience has proven, that almost without a single exception, the thousand and one different kinds of ventilators that are made and fitted up for the purpose of drawing off the foul air, do quite the opposite, sending down instead floods of cold air, which cools and forces down the hot vitiated air, that is loaded with carbonic acid gas, a most deadly poison, and other poisonous and deleterious matters, the products of combustion, and which is taken into the lungs, and from thence passes into the blood, poisoning and vitiating it, and irreparably deteriorating the whole system mentally and physically, besides being the cause of the greatest annoyance and injury to those sitting under the ventilators, through the cold air falling upon the head and body when they are in a heated state, the pores open, and most liable to be affected injuriously by any sudden changes of the temperature. It is an established fact that this is one of the most prolific sources of severe colds, rheumatics, and consumption, and a host of other dangerous complaints which are generally attributed by the persons affected to every other cause but the right one. Happily, people are now coming to be more fully aware of this, and also of the essential importance and great value of good and safe ventilation, and how to obtain it is the grand question that for some time back has been occupying the attention of, we may say, the whole civilized world. Innumerable plans have been devised and tried with the hope of accomplishing the purpose, but they have invariably been found wanting, and utterly deficient as regards the most essential points. Now the chief causes of this almost universal failure are first, that in the construction of the different apparatus, and their application for the purposes of ventilation, the laws of nature were either most imperfectly understood, or not sufficiently taken into consideration. Or, that the apparatus was of such a complicated nature, and depended upon the perfect working of its movable parts for its efficient action, that in a short time it got out of order, and was thus rendered entirely useless for the purposes intended. In fact, any ventilator that has a movement in it, or that requires attention, must be considered a most imperfect and unreliable one, owing to its liability to get out of order, and the necessity for continued attention to ensure its efficient working. In the majority of cases the required attention is seldom given, and the ventilation of a building suffers accordingly. Now what is required is an apparatus that is continuous in action, requires no attention, has no mechanical movement, and is entirely free from draughts or currents. All this is accomplished by the ventilator invented by Messrs. Boyle & Son, and called by them "*The Self-Acting Air-Pump Ventilator*," that being the principle upon which it is constructed. It effectually extracts the vitiated air as it is generated, and is entirely free from down-draught. Having no mechanical motion it can never get out of order, and requiring no attention, the ventilation of a building can never suffer through neglect. It can also be constructed to harmonize with every style of architecture. In conjunction with this ventilator, the Messrs. Boyle have an exceedingly simple, but most ingenious system for admitting a sufficient supply of fresh air into the building, without the slightest draught or current being felt. Indeed when in a church, hall, or school, that is ventilated on Messrs. Boyle's plan, one is not aware that there is any ventilation going on at all, except by the delicious purity and refreshing coolness of the atmosphere they are breathing, no matter how crowded the place may be. The success and thorough efficiency of the "Air-Pump Ventilators" are now beyond a doubt. They have now been in use for several years, and are being generally adopted throughout the kingdom and extensively used abroad, especially in the Colonies where they are considered a perfect boon by the colonist, succeeding where everything else had failed. The highest testimony has been given as to the efficiency of these ventilators, and they only require to be seen in action to satisfactorily demonstrate their power and superiority over every other ventilator that is in existence. They are in fact as near perfection as can be, and more than that cannot be attained. It would indeed tax the ingenuity of the most ingenious to produce an apparatus more complete or suitable for the purpose intended.

Amongst the principal public buildings to which Messrs. Boyle and Son have applied their system are included the Royal Exchange; Bank of England; Admiralty; the Laboratory, and Council Chamber of the Royal Society; Burlington House; St. Paul's Cathedral; Foundling Hospital; Spurgeon's New College, Newington; Rev. Newman Hall's Memorial Church; Council Chamber of the Royal Institute of British Architects; Library of the Inner Temple; Madame Tussaud's; Houses of Parliament, Melbourne, Victoria; Corporation Halls and Picture Galleries, Glasgow; Police Courts, Fever Hospitals, Infirmaries, Clubhouses, etc., etc. The ventilation of the Library of the Inner Temple had always been in a very bad state, and to improve it at last became to be considered as next to impossible, and it was given up as a hopeless case, when Mr. Arthur Cates, Architect to the Land Revenues of the Crown, and Surveyor to the Honourable Society of the Inner Temple, bethought him of applying to Messrs. Boyle & Son, to see if they could remedy matters. They readily consented to take the work in hand, and to show the thorough confidence they had in their system, even when it was going to be applied to such a seemingly hopeless case, and where everything else tried had failed, they gave a guarantee to effectually overcome the evil, and that the ventilation of the Library should be to the entire satisfaction of all concerned. The following testimonial received by them shows how they succeeded:—

London, Whitehall Yard, S. W., September 20th, 1876.

Gentlemen,—I have used your Air-Pump Ventilator, with satisfactory result. Those fixed under my direction at the Library of the Inner Temple have realized my expectations, and completely fulfil the object which I had in view. I consider this application of them a severe test, and the success which has attended it confirms the statements which you make as to their efficacy.

Yours obediently,

ARTHUR CATES.

Messrs. Robt. Boyle & Son,
Mansion House Buildings, London.

This may be considered, and it certainly is, a great triumph for Messrs. Boyle, but it is nothing unusual to them, as their system is next to infallible, when applied under their direction. There is scarcely a building in existence that they would not undertake to ventilate satisfactorily, if given into their hands, no matter how many things might have been previously tried and been unsuccessful. They devote their whole time and attention to the subject of ventilation, and have studied it in its most scientific and practical forms, and are therefore thoroughly competent from their great practical experience and scientific knowledge to advise on anything relating to ventilation. Sir William Thomson, Professor of Natural Philosophy, Glasgow University, in expressing his opinion upon the "Air-Pump Ventilators," says—"I have seen several different forms of Messrs. Boyle's 'Air-Pump Ventilators' in actual operation, and have much pleasure in testifying to their efficiency. They thoroughly realise the favourable anticipations which I formed from experiments on models shown me by Mr. Boyle. Having one fitted up in my yacht, I find it has caused a very decided improvement in the draught." Nothing could be more favourable than this, coming as it does, from the greatest scientific man of the day, and one who, we naturally suppose, would be thoroughly conversant with the subject. This flattering commendation expressed by Sir William must be of the greatest value to Messrs. Boyle, as from the high and responsible position he holds, he naturally would be very cautious and sure of what he was saying, before expressing himself so emphatically. The ventilators are also applicable for ships, and from their continuous action and requiring no attention they are invaluable on board vessels. They are fitted up in several ships of the Royal Navy, including the Flag Ships "Monarch," "Minotaur," and "Lord Warden," and they are also used in the Peninsular and Oriental Steam Ship Company's vessels; the Anchor Line, State Line, etc., etc., and from which reports testify to their efficiency. They are admirably suited for the ventilation of sewers, water closets, and soil pipes. Messrs. Boyle are making a speciality of these, and in every case guaranteeing superior results to any thing else that has been or may be tried.—*British Mercantile Gazette.*